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Statefinder analysis of the superfluid Chaplygin gas model

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Abstract

The statefinder indices are employed to test the superfluid Chaplygin gas (SCG) model describing the dark sector of the universe. The model involves Bose-Einstein condensate (BEC) as dark energy (DE) and an excited state above it as dark matter (DM). The condensate is assumed to have a negative pressure and is embodied as an exotic fluid with the Chaplygin equation of state. Excitations forms the normal component of superfluid. The statefinder diagrams show the discrimination between the SCG scenario and other models with the Chaplygin gas and indicates a pronounced effect of the DM equation of state and an indirect interaction between their two components on statefinder trajectories and a current statefinder location.

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Keywords

dark energy theory, dark matter theory